UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,350	09/23/2003	Yuji Shinkai	117259	3395

25944 7590 11/15/2006

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
TUGBANG, ANTHONY D	
ART UNIT	**PAPER NUMBER**
3729	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,350	SHINKAI, YUJI	
	Examiner	Art Unit	
	A. Dexter Tugbang	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) *1-24,27,33,34,37 and 38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,26,28-32,35,36 and 39-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The applicant(s) amendment filed on August 21, 2006 has been fully considered and made of record.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

3. The applicant(s) again traverse the restriction requirement to the extent that Group I cannot be made by a materially different process and thus, should be rejoined with the elected invention. The applicant(s) assert that the product of Group I includes the feature of a thermosetting resin and therefore, heating must occur in the product, because of the thermosetting resin.

The examiner traverses because patentability of the product hinges on the final structure and not how the product is made. MPEP § 2113. So the final structure of Group I, while it must include the structure of a resin, does not require a "thermosetting" resin. Because the final structure does not require a thermosetting resin, no heating steps are required in the final structure of the resin or of the inkjet head. For example, the final structure of the product of Group I can be made by coating a resin and subsequently etching it to produce a certain shape of the resin and the final structure of the ink jet, without any thermosetting aspects or without any heating.

4. Claims 1-24, 27, 33, 34, 37 and 38 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on February 6, 2006.

Specification

5. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

6. **Again**, the abstract of the disclosure is objected to because the content does not appear to include any of the process steps of the claimed invention (e.g. in either Claim 25 or 31).

Correction is required. See MPEP § 608.01(b).

7. **Again**, the title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --A Method of Manufacturing an Ink Jet Head.—.

Claim Rejections - 35 USC § 102

8. Claims 25, 26, 29, 31, 32, 35, 41 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Eifuki et al 6,000,127.

Regarding Claim(s) 25, 29, 31 and 35, Eifuki discloses a method (Figures 2A-2C) comprising: disposing a metallic bond (precoating 25) and an epoxy thermosetting resin (e.g. 18) between a terminal (bumps 6 or 7) and a land (electrodes 1 or 2); pressing the land and terminal so that they are brought near each other for discharging at least part of the resin from a gap between the land and the terminal, and bring the metallic bond into contact with the land (see Fig. 2B); and heating the metallic bond and the resin so that the land and the terminal are electrically connected to each other with the metallic bond being disposed in a region between the land and the terminal and a protrusion is made of the thermosetting resin in the connection portion between a main electrode portion and a land, and part of the bond is covered with the resin (see Fig. 2B, and all of which discussed at col. 4, lines 4+).

Regarding Claim(s) 26 and 32, Eifuki further teaches that the protrusion of thermosetting epoxy resin extends outside of the connection portion and surrounds the land, the terminal and the metallic bond (shown in Fig. 2C).

Regarding Claim(s) 41 and 43, the sequence of Eifuku's Figure 2a through 2c show that the disposing step occurs before the pressing and heating steps.

Again, with respect to the process steps being drawn to an ink jet head with all of the associated elements specific to the ink jet head (lines 1-14 of Claim 25 and lines 1-14 of Claim 31), these limitations recited in the preamble of the claims are intended use limitations and have not been given patentable weight since the body of the claims do not depend upon the preamble for completeness and the process steps are able to stand alone. *In re Hirao*, 535 F.2d 67 190 USPQ 15 (CCPA 1976).

Claim Rejections - 35 USC § 103

9. Claims 25, 26, 28, 29, 31, 32, 35 and 41 through 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiwada 6,270,193 in view of Eifuku et al.

Regarding Claim(s) 28, Hiwada discloses a method of manufacturing an ink jet head comprising: connecting an actuator unit to a printed circuit board (see Figures 4 and 11A-11C).

Regarding Claim(s) 30, 36 and 40, Hiwada alternatively discloses a method of manufacturing an ink jet head including pressure chambers (e.g. 21d) arranged in a matrix in a plane of an ink passage unit (e.g. 21) that includes lands (e.g. 68, 69).

Regarding Claim(s) 25 and 31, Hiwada further teaches disposing a metallic bond (bumps 64 (in Fig. 11B) and a conductive adhesive (e.g. 65) between a terminal (e.g. 62, 64) and the land (e.g. 68, 69), pressing the land and the terminal, and heating the metallic bond and the conductive adhesive.

Regarding Claim(s) 42 and 44, Hiwada shows in Figures 11A through 11D, a thermosetting adhesive (e.g. 65) disposed only in a region (e.g. entire ink jet passage unit 21) opposed to a wall portion of the pressure chamber.

Regarding Claim(s) 41 and 43, the sequence of Hiwada's Figure 11A-11C shows that the disposing step occurs before the pressing and heating steps.

Hiwada does not teach that the thermosetting conductive adhesive is an epoxy thermosetting resin.

Eifuku teaches a bonding process (as noted in paragraph 7 above) that includes an epoxy thermosetting resin for the benefit of improving overall working efficiency (see col. 1, lines 17-25 and lines 59-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Hiwada by utilizing the bonding process including a thermosetting resin, as taught by Eifuku, to advantageously improve the overall working efficiency.

10. Claims 30, 36, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiwada in view of Eifuku et al, as applied to claims 25 and 31 above, and further in view of Kishi 6,095,641.

Hiwada, as modified by Eifuku, discloses the claimed manufacturing method as relied upon above in Claims 25 and 31. The modified Hiwada method does not teach that the matrix forms at least three rows and three columns of the pressure chamber in a plane of the ink passage unit.

Kishi shows that in making an ink jet print head, stacking the pressure chambers (as shown in Fig. 1) can occur to product a matrix of pressure chambers of at least three rows and at least three columns in a plane of an ink passage unit. This process of Kishi provides an

increased manufacturing efficiency (col. 3, lines 7-11) and also allows more ink to eject with a higher resolution.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Hiwada, by stacking the pressure chambers to produce a matrix of pressure chambers of at least three rows and at least three columns in a plane of an ink passage unit, as taught by Kishi, to provide the advantages of increased manufacturing efficiency and allow more ink to eject with a higher resolution.

Regarding Claim(s) 39, the parameter of an Anisotropic Conductive Adhesive (ACP) is considered to be effective variable to achieve a desired result through routine experimentation. *In re Aller*, 220, F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Therefore, the limitations drawn to the use of ACP for the thermosetting resin would have been an obvious improvement to one of ordinary skill in the art over Hiwada and Eifuku through routine experimentation.

Response to Arguments

11. The applicant(s) arguments filed August 21, 2006 have been fully considered but they are not persuasive.

In regards to the merits of Eifuku et al, the applicant(s) argue that Eifuku does not teach "a land disposed on the piezoelectric element in a region opposed to the wall portion" of the pressure chamber, as required in each of Claims 25 and 31.

The examiner notes that the limitations in question above are recited in the preamble of the claim and do not further limit the body of the claim, where the body of the claim is those limitations that are presented after the transitional phrase of "method comprising".

The examiner's position is that when reading the claim in its entirety, the body of the claim does not breath life, meaning and vitality into the preamble because the body can stand completely alone, independently, without the need for the preamble. The specific relationship of having the land disposed on the piezoelectric element in a region opposed to the wall portion *is not recited in the body of the claims*. While the body of the claim does recite the "land", this land can be interpreted as a land in a completely separate device, such as one without any piezoelectric element, or one that is not an inkjet head component. If the applicant(s) wish to have the body of the claim breath life, meaning, and vitality into preamble such that there is a nexus between the preamble and the body, then the claims would need to be amended such that the body would include the feature of the land being disposed on the piezoelectric element in a region opposed to the wall portion.

In regards to the merits of Hiwada, the applicants argue that Hiwada does not teach any pressure chambers and Hiwada does not teach disposing a metallic bond and a thermosetting resin between the terminal and the land disposed on the piezoelectric element in a region opposed to the wall portion, as required in Claims 25 and 31.

Again, the examiner most respectfully disagrees.

Apparently, the applicant(s) have not looked at Hiwada's Figure 4. Here, Hiwada clearly shows a piezoelectric inkjet head with a piezoelectric element (e.g. 21c) and pressure chambers (e.g. 21d). These pressure chambers clearly have wall portions. Hiwada has an ink passage unit (e.g. 21) that is made up of lands (e.g. 68, 69, shown in Figs. 5 and 6) and a piezoelectric element (e.g. 21c) with pressure chambers that include these wall portions. So the land (e.g. 68, 69) is disposed on the piezoelectric element and the wall portions, since both make up the ink passage

unit (e.g. 21). Thus, Hiwada teaches that a metallic bond (e.g. 64) and a thermosetting adhesive (e.g. 65) exist between the terminal (e.g. 62, 64) and the land (e.g. 68, 69) disposed on the piezoelectric element in a region opposed to the wall portion of the pressure chamber. Hiwada teaches all of the structure required in the preamble and most of the limitations in the body of Claims 25 and 31, with the exception of the thermosetting adhesive being a "thermosetting resin". However, the thermosetting resin was relied upon in Eifuku et al. The examiner notes that the connection shown in Figure 2C of Eifuku is nearly identical to the connection shown in Figure 11D of Hiwada, and would thus, be an obvious combination since both are solving the same problems of providing a metallic bond with a thermosetting material between a terminal and a land.

Accordingly, the rejections are hereby maintained for the reasons set forth above.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

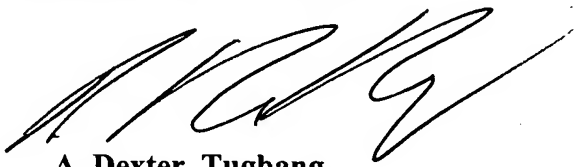
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570. The examiner can normally be reached on Monday - Friday 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



A. Dexter Tugbang
Primary Examiner
Art Unit 3729

November 13, 2006